

# Ground Squirrel Control in Montana

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**The most prominent ground squirrel found in Montana is the Richardson ground squirrel that prefer the meadow and grassland. The Columbian ground squirrel lives in western Montana and control methods are recommended when they start to damage the land or overpopulate it.**

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## **RICHARDSON GROUND SQUIRRELS ARE MEADOW**

and grassland rodents and are the most prominent species of ground squirrel found in Montana. Because of their preferred habitat, Montana has large populations of ground squirrels throughout much of the state in cropland, pastures, golf courses and urban settings.

The Columbian ground squirrel is found on the western side of Montana. With minor variations (primarily related to later timing of treatments), the control methods described here can be used for Columbian ground squirrels.

Control methods are recommended at times when land becomes damaged or overpopulated by ground squirrels. Research in Montana has shown a 24 percent average reduction in alfalfa forage yield in areas infested with ground squirrels. Hay losses due to ground squirrels in Montana could exceed \$15 million annually.

## **Identification**

People often refer to ground squirrels as “gophers.” This nickname can be an issue because there are species-specific control methods for both ground squirrels and pocket gophers.

As with other ground squirrels, the Richardson ground squirrel looks more like a tree squirrel (Figure 1) whereas pocket gophers look more like short-tailed rats with cheek pouches and large incisors (Figure 2, page 2). Richardson ground squirrels can be yellowish-tan to gray in color. Adults reach 12 inches in length with a 2-4 inch tail.

Ground squirrels spend a considerable amount of time above ground, whereas pocket gophers spend 99 percent of their life underground.

## **Habitat & Biology**

Ground squirrels live in an extensive system of burrows up to six feet in depth with multiple entrances to the surface that are left open (pocket gophers plug their entrances). Ground squirrels feed above ground and their diet consists of grasses, forbs and seeds. They also store large quantities of food in their burrows before

hibernation which begins as early as August.

Males emerge after hibernation, during early spring to establish territories. Female ground squirrels emerge one to two weeks after the males and immediately begin breeding.

Following a 28-day gestation, 2-14 young are born. This large amount of

offspring can lead to densities of over 20 ground squirrels per acre.

Young exit the burrow at around five weeks of age to begin foraging. Mortality rates among young ground squirrels is very high due to predation and exposure while trying to establish a new territory.

## **Damage Prevention & Control Methods**

When controlling a ground squirrel population, it's more economically sound to eliminate the population than to reduce it. Because ground squirrels have an average litter size of 10 and a maturity age of 10 months,



**FIGURE 1. Richardson ground squirrel**



**FIGURE 2. Northern pocket gopher**

their populations can multiply quickly. Even with a juvenile mortality rate of 85 percent because of exposure, starvation, predation, etc., it's best to eliminate the adults before they reproduce for a better chance of control.

### ***Cultural Methods and Habitat Modification***

Ground squirrels typically build the major part of their burrows at the edge of fields then extend into the field as the colony matures. Tillage is an effective way to regenerate an area by covering tunnel holes and flattening mounds so the area can be replanted. This will make the area less attractive to nearby colonies that may expand. There have been studies that indicate the tall grasses may lead to reduced ground squirrel reinfestations.

Flood irrigation of fields will also limit ground squirrel use of an area.

### ***Exclusion***

Exclusion of ground squirrels is typically expensive and impractical. Ground squirrels can easily climb and dig around most barriers. Ground squirrels rarely damage shrubs, trees, and other ornamentals, but if damage occurs, barriers can be made of wire mesh or cylindrical plastic netting.

### ***Repellents and Frightening Devices***

Repellents and frightening devices such as noise making and ultrasonic devices have not been proven to control ground squirrel populations when tested in unbiased research trials.

### ***Flooding***

Flooding tunnel systems will sometimes force rodents from their burrows if the burrows are not extensive and soils are heavy. As the animals try to escape they can be killed. Always take precautions when flooding burrows that are adjacent to structures that may be damaged by water.

### ***Natural Control***

Predators such as raptors, snakes, coyotes, and badgers will feed on ground squirrels. Predators however, will not effectively control a ground squirrel population. Although they take a number of individuals, the predator success rate declines before the population is significantly reduced.

### ***Toxicants***

Always use rodenticides according to label instructions.

Early spring is the best time for ground squirrel control, especially when applying toxicants. This is because males and females have just emerged from hibernation and there is little green vegetation available. Also, by late spring-early summer, green-up has occurred which makes the vegetation much more palatable to ground squirrels than baits. Birth and emergence of young also occurs later in spring, increasing the number of animals that must be baited.

There are several toxicants registered for ground squirrel control in Montana. Always read the label before purchase because some chemicals are labeled "restricted use." This means that you must possess a pesticide applicator license to purchase the product. Although most farmers and ranchers possess the required license, homeowners are usually limited to purchasing "general use" pesticides.

Zinc phosphide and anticoagulants such as chlorphacinone (Rozol®) are restricted use toxicants registered for ground squirrel control. ALWAYS follow label directions for safe and effective use. These products are placed near the entrance of each burrow.

Zinc phosphide is a single dose rodenticide and can have a control rate of 90 percent. Because it is distasteful to ground squirrels, zinc phosphide treatments require pre-baiting with clean, untreated oats so ground squirrels will accept the bait. Zinc phosphide treated bait is distributed two to three days after pre-baiting and should be distributed when the ground is dry and rain is not forecasted.

Chlorphacinone (Rozol®), because it is an anticoagulant poison, must be fed over a period of several days to be effective. The product is placed outside each burrow opening and then reapplied a few days later.



### **Strychnine is not legal for ground squirrel control.**

Confusion arises because strychnine can be sold for underground use to control pocket gophers.

Using strychnine in a manner not in compliance with the label can affect unintended targets such as other wildlife and pets. A small amount of strychnine can be fatal to dogs with symptoms occurring within minutes.

### **Bait Stations**

Bait stations are used to provide a continuous supply of anticoagulant bait for ground squirrels (Figure 3). As the ground squirrels feed on the bait over several days, anticoagulant baits cause internal bleeding by disrupting the ability of blood to clot. Compared to single lethal dose rodenticides, secondary hazard to non-target animals is reduced when using anticoagulant baits.

Diphacinone (Ramik®) is a general use anticoagulant that can be purchased without a pesticide license. Ramik® is labeled for use in bait stations. Always follow label directions when using Ramik®.

Bait stations can be made from three, 24-inch-long pieces of PVC pipe. Pieces are connected with a tee and a cover on the upright part of the tee with a removable cap. Stand the stations upright (spaced 65 yards apart) and attach to a fence post or a post driven into the ground. Remove the cap and fill the tube with bait. Ground squirrels enter the bait station through the horizontal pipes and eat the bait, which is made available as it drops down from the capped vertical pipe. **It is very important to keep the bait stations supplied continuously with the anticoagulant bait.**



**FIGURE 3. PVC bait stations used for ground squirrel control.**

### **Fumigants**

Fumigation can be effective for controlling ground squirrels when soil is moist enough to minimize diffusion of gas and the tunnel system is not too extensive. Restricted use products such as aluminum phosphide tablets (Phostoxin®) are effective and there are also many types of gas cartridges that are available for general use.



**FIGURE 4. Body gripping trap placed over an entrance to a ground squirrel tunnel.**

### **Trapping**

Smaller populations of ground squirrels can be controlled with traps. Body-gripping (Conibear®) traps (6 inch x 6 inch) are placed over all open holes (Figure 4). It is best to use several to dozens of traps so trapping can begin on one end of the colony and work across the area. If other wildlife or pets are a concern in small areas, milk crates can be placed over body gripping traps for safety purposes.

Live traps (5x5x18 inch) also work for ground squirrel control when baited with peanut butter and rolled oats. Releasing the trapped ground squirrel is not recommended due to the fact that the animal will try to return to their original colony or, will be driven off if placed in a new colony and will most likely die of starvation, exposure or predation while trying to relocate. Drowning is a humane and safe way of disposing of a live-trapped ground squirrel.

Traps should be checked daily and moved if not sprung within 48 hours.

### **Shooting**

Some people enjoy shooting ground squirrels as a recreational pursuit. However shooting is not an effective method of population control. Shooting ground squirrels is time-consuming, expensive and the animals tend to become extremely cautious. This method will typically reduce the population until juveniles dispersing from nearby colonies reoccupy the vacated burrows.

### **Other methods**

Propane exploding devices are advertised to control ground squirrel populations. These devices inject propane into the burrow and it is ignited. Even though the resulting explosion is certainly impressive and some operators have reported some degree of control, these devices are expensive. Tests by the Montana Department of Agriculture have found propane exploding devices to be less effective than other methods of control.

Gumballs have also been reported to clog the intestinal tract of ground squirrels. These reports are not backed by research and there is no evidence that ground squirrel populations will consume enough gumballs to result in reliable control.

## Acknowledgements

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